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EDITORIAL

THAT thorny subject, the treatment of bronchial carcinoma, came up for discussion again recently, and the paper given on that occasion by Gwen Hilton is included in this issue. Certainly not more than 10 per cent. of these growths are operable, a figure that will be slow to increase. Earlier diagnosis, though so desirable, will be delayed in application outside a narrow circle of experienced practitioners, and growths in the hilar structures and early metastasis will always defeat even the most radical and speedy surgery. It is therefore probably true to say that the rôle of surgery will remain limited to a small fraction of the total cases. Of the others, many have been given radiotherapy in the past; their suitability for it and the results are still a subject of much debate.

The present paper is concerned with a review of the inoperable cases seen by the writer over a recent four-year period. Unsuitable for radical treatment were those too ill, too wasted or too distressed, those with massive tumours, secondary glands or distant metastases and those with untreatable sepsis, tuberculosis, or effusion due directly to the growth's metastases. Of the series treated, 47 out of 179 had a radical course, and 46 others palliative treatment to relieve pain, venous engorgement or some other particular feature due to the growth. The untreated cases lived ten weeks, those having palliative treatment five months, and those that had radical treatment eleven and a half months on the average of those dead up to December last. Twelve were still alive at that time, with an average duration of life of twenty-six and a half months, and 8 leading a normal life. Of these 12, 4 had squamous carcinomas, 1 adenocarcinoma and 1 an undifferentiated growth—and all of these had survival times around the average when the figures were taken, with the exception of the patient with the adenocarcinoma, who had already lived for fifty-two months. Though the series is limited and though also, by making a rigid selection of those admitted to radiotherapy and confining this to the better risks at the time of treatment, the ultimate survival times of the two groups subsequently would be influenced favourably to those treated, the fact remains that growths of reasonably limited extent found in patients not too ill and free from complications, do respond to radiotherapy, sometimes remarkably, as shown better by regression of the tumour itself and an improved patient than by any figures of mortality. This emphasis upon the effect that radiotherapy exerts upon the course of the disease has always seemed to us a more cogent and visible argument for its use than survival rates, however

exactly calculated or corrected for the various errors that intrude. The illustrations that accompany the present paper are good examples of their kind, in this respect, and the same stress upon the importance of judging radiotherapy from a clinical point of view applies with even greater force to its use for palliative relief alone.

Unfortunately the material in the present paper is not sufficient for any statement upon the comparative results with different forms of bronchial cancer; but that is a vast undertaking to assess with any degree of accuracy. We know the anaplastic growths at one end of the scale, quick growing, in young subjects often, and highly radiosensitive; at the other end the squamous form, in an elderly subject often living several years after the growth is discovered. Between the two lie the vast number of tumours of varying susceptibility, and it is still in that group where opinion is most apt to go astray upon the chances of success with irradiation, and where co-ordinated research will bear the fullest fruit. But that there is a valuable field for radiotherapy in the disease the paper in this issue seems to us to place beyond doubt, despite the gloomy attitude so often taken.

C. H.

GENERAL ARTICLES

RADIOTHERAPY IN INOPERABLE CASES OF CANCER OF THE BRONCHUS

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It is generally admitted that the incidence of cancer of the bronchus is on the increase. Up to the present only a small proportion of these cases of cancer of the bronchus have been found operable. Brock,[1] in a recent paper, stated that the actual operability rate is approximately 8 per cent. The only treatment that is possible for some of the remainder is irradiation by X-rays or radium. In the past the results were almost uniformly bad and irradiation treatment fell largely into disrepute. Death was said to be accelerated by such treatment. Quite recently Reinhoff[2] stated that radiation therapy is ineffective and the disease when so treated is always fatal. On the other hand, more hopeful reports have been published. For instance, Holmes[3] said that by careful selection of cases for irradiation and proper planning of the treatment in the individual case, good palliative results can be obtained in the " oat-cell " and other highly malignant tumours; and that at the present time irradiation should be the treatment of choice. In 1943, Leddy[4] summarised the results of X-ray treatment in many clinics. He concluded that the value of irradiation therapy as a palliative measure in cases of bronchiogenic carcinoma of the lung was self-evident. This palliative value of X-ray treatment in selected cases was also stressed by Pohle and Siris.[5]

In view of these contradictory opinions, it was thought worth while to analyse the inoperable cases of cancer of the bronchus seen at University College Hospital during the years 1940-43 inclusive, and to evaluate the benefit, if any, received by those patients who had received X-ray treatment.

This article does not attempt to review the many modern articles on the subject. The summary by Leddy[4] contains a list of references up to 1943. The observations to follow are concerned with the results obtained in this hospital, and the basis for the decision as to whether X-ray treatment should be given.

It is considered that a large number of the bad results in the past have been due in part to the practice of accepting for radiotherapy any case of inoperable growth in the chest in which it was considered that " something should be done." It should now be recognised that just as the selection of cases for surgery requires careful judgment, so also does the selection of cases for radiotherapy, and, in particular, it needs experience to decide in which cases radical treatment and in which palliative treatment should be given:

* Based on a paper read before the Society of Thoracic Surgeons of Great Britain and Ireland on January 26, 1945.

radical treatment meaning a course of X-ray treatment in which enough irradiation is given in an attempt to eradicate the disease; palliative treatment meaning a course of X-ray treatment in which only enough irradiation is given to relieve pain, dyspnœa and asphyxiating pressure symptoms. Some patients may be made more ill by irradiation without any eventual benefit. Such cases must naturally be excluded from radiotherapy.

The following factors are taken into consideration in selecting cases suitable for a radical course of X-ray therapy. The general condition is of prime importance. The patient must be fairly well. If he seems to be ill, wasted or distressed, with high fever and a raised pulse-rate, he will not stand a does sufficient to cause regression of the cancer. The tumour-bearing area should be limited in extent. If there is a vast mass of glands filling the mediastinum, a sufficient dosage cannot be given to sterilise the growth without causing severe constitutional disturbance, except when the growth is very anaplastic in type. Enlarged supraclavicular glands and distant metastases, of course, preclude radical treatment. The high dosage necessary in a radical course cannot be given in the presence of severe sepsis. Irradiation of the lung containing loculated pus may cause a great acceleration of the septic process with subsequent necrosis of lung. Fatal hæmorrhage may ensue. In some cases it is possible to reduce the septic process at bronchoscopy by aspiration of the pus and then subjecting the patient to daily tilting exercises. After such preparation, irradiation can occasionally be undertaken. In the presence of an empyema irradiation can be carried out, provided there is free and adequate drainage. Penicillin was not available for use from 1940 to 1943, but there are indications that it is of value in controlling lung sepsis in this type of case.

Active tuberculosis of the lungs in association with carcinoma of the bronchus is a contra-indication to irradiation. , Rapid spread of the tuberculous process throughout the lung tissue may quickly follow irradiation. An apparently inactive focus may occasionally be lighted up by irradiation. Irradiation in a case with a large effusion from neoplasm may cause sudden increase in the amount of fluid, causing displacement of the heart and sudden death. The presence of an effusion also prevents the possibility of giving sufficiently high dosage to the tumour because of scattering of the rays by the fluid. Treatment is sometimes combined with frequent aspiration of the fluid. This procedure rarely succeeds, as the fluid recurs so quickly. Diabetes, although not a contra-indication, usually renders the response to irradiation less satisfactory. A most careful watch has to be kept on the amount of insulin needed during the course, as the balance is frequently upset while the patient is being treated.

Before giving a second course of X-ray treatment to a patient, care is taken to make sure that the full effect of the first course has taken place. Often further treatment was asked for because the whole of the opacity in the lung field had not disappeared, but it should be realised that the effect of irradiation continues for several months after the actual application of the rays is ended. The response to irradiation can, therefore, only be judged by studying radiograms of the chest taken at intervals after the end of the course. Various post-irradiation changes can take place in the lung tissue, giving an X-ray picture which can closely simulate a recurrence of cancer. It is important

not to treat these cases, because irradiation of lung containing these post-irradiation changes is always dangerous, and frequently leads to a fatal issue. These changes are not always seen in irradiated lung tissue. Their occurrence has been said to be produced only in cases which have received very high dosage. This, however, is not always the case, as they sometimes occur in cases of asthma which have received relatively small dosage. Three stages of reaction may be seen radiologically in that part of the normal lung through which irradiation has passed. During the first stage, loss of translucency of the lung field is noted, shortly followed by the appearance of soft mottled shadows. This is due to hyperæmic alveolar infiltration of leucocytes and increased secretion of mucus in the bronchi. In the second stage, the shadowing becomes more definite, simulating bronchopneumonic patches. All these changes, including inflammatory processes such as peribronchial, perivascular, and actual broncho-pneumonia, reach their maximum one to two months after irradiation and then slowly regress. The third change, which may be called regenerative, is due to fibrous tissue formation and sclerosing processes. This stage, however, may never be reached; the lung tissue may break down and cavitation may occur as a result of the second stage.

The X-rays of the following case demonstrate the radiological picture shown when the reaction is passing from the second to the third stage. Irradiation had been given to a solitary metastasis in the lower zone of the left lung (Case 1) (Fig. 1). Six months previously the patient had had a pneumonectomy of the right lung for an adenocarcinoma. At the end of the course of treatment the metastasis had become much smaller. The lung tissue surrounding the metastasis was quite translucent (Fig. 2). One month after the end of treatment the metastasis had disappeared. Ten weeks after treatment, a radiogram showed some loss of translucency of the left lower zone, followed two weeks later by the appearance of multiple soft, mottled shadows throughout this area. Sixteen weeks after treatment some parts of the mottled shadowing became more linear in character (Fig. 3). Another metastasis then appeared in the left upper zone, similar in appearance to the original one in the left lower zone. Further metastases also appeared elsewhere in the body, and the patient died. Post-mortem examination with serial sections taken through the whole of the left lung showed typical adenocarcinoma cells at the site of the upper metastasis, but no carcinoma cells were found in the lower zone which had been treated. Serial sections of this zone showed patches of broncho-pneumonia and small areas of fibrosis with poorly cellular, delicately collagenous tissue. The bronchi were inflamed. The pathological picture was evidently passing from the second to the third stage of the reaction.

In other patients who have survived and have been followed up over several years, dense fibrotic strands gradually replace all the soft mottled areas (Fig. 4) (Case 2).

One of the chief causes of failure of irradiation therapy is inadequate irradiation of the whole of the cancerous tissue. Exact localisation of the tumour and estimation as far as possible of the extent and probable glandular involvement was therefore undertaken before treatment was begun. Experience alone will decide which part of the X-ray shadows is due to growth itself, and which is due to lung collapse resulting from growth. All the cases

treated were fully investigated by the usual methods of X-rays, bronchograms, tomograms, bronchoscopy and in some cases thoracotomy, and were diagnosed as carcinoma of the bronchus by a thoracic surgeon, a chest physician, and a radiologist. It was, however, impossible to carry out full investigations in many of the untreated cases, as they were too ill, but the diagnosis in these cases was confirmed by a post-mortem examination when possible. Invaluable help was received from the surgeon's bronchoscopy report, not only as to the site of the lesion, but as to its histology. The planning of the areas for irradiation was greatly facilitated by the knowledge of the microscopic report, since it gave some indication as to dosage and as to the likely character and path of spread of the tumour.

Radium was not employed in the treatment of any of the cases. The planning of homogeneous irradiation by interstitial radium was not considered possible in these cases of inoperable cancer, and the grave risk of penetration of a large blood-vessel, causing hæmorrhage or an embolism by a seed or needle, was not thought justifiable. Nor was the introduction of a radon container into growths of the main bronchi considered to be suitable. The action of the radon is confined to a very small area surrounding the container in the bronchus. Thus, only a small portion of the growth in or adjacent to the bronchus can be so irradiated, leaving the majority of the growth untreated. The regression of the intrabronchial growth does, of course, often relieve bronchial occlusion and allow free drainage. This effect, however, can be produced by X-ray treatment at the same time as irradiation of the peripheral parts of the tumour and any glandular involvement.

X-ray treatment was, therefore, used in all the cases. As this paper was not primarily written for radiotherapists, details of technique are omitted. In this department, it is considered that satisfactory results can only be obtained if the radiotherapist makes a daily examination of the patient, studies the temperature, pulse and respiration charts, and adjusts the dosage to the clinical response. This, of course, is in addition to exercising supreme care in the directioning and localising of the rays. The radical course is spread over six to seven weeks.

X-ray treatment is commonly given a bad reputation for making patients more and more ill as the course proceeds. Generally speaking, this has not been our experience. We consider that if the case has been carefully selected, if the dosage is correctly given, and if the patient is going to respond, improvement should be noticed fourteen to twenty-one days after the beginning of the course, somewhat earlier in cases of anaplastic tumours. Symptoms should begin to be relieved and there should be a steady improvement in the general condition. The patient should put on weight steadily throughout the course. Chart 1 shows the weight charts of three patients during their course of treatment, and during the remainder of the year after treatment. It will be noted that the curves begin to rise as soon as the treatment is started. The two lower curves show a particularly sharp rise during the first two months—that is, during the actual treatment.

The following three case reports indicate the response to X-ray treatment in patients having an "oat-cell," a squamous cell and an adenocarcinoma, respectively.

CASE 3.—A man aged 27 was first examined on 12.6.40, the case being kindly referred to me by Mr. Tudor Edwards. He had a history of an attack of pleurisy, followed by continuous pain in the left side of the chest for eight months, dry cough, and loss of voice for one month, and loss of weight for

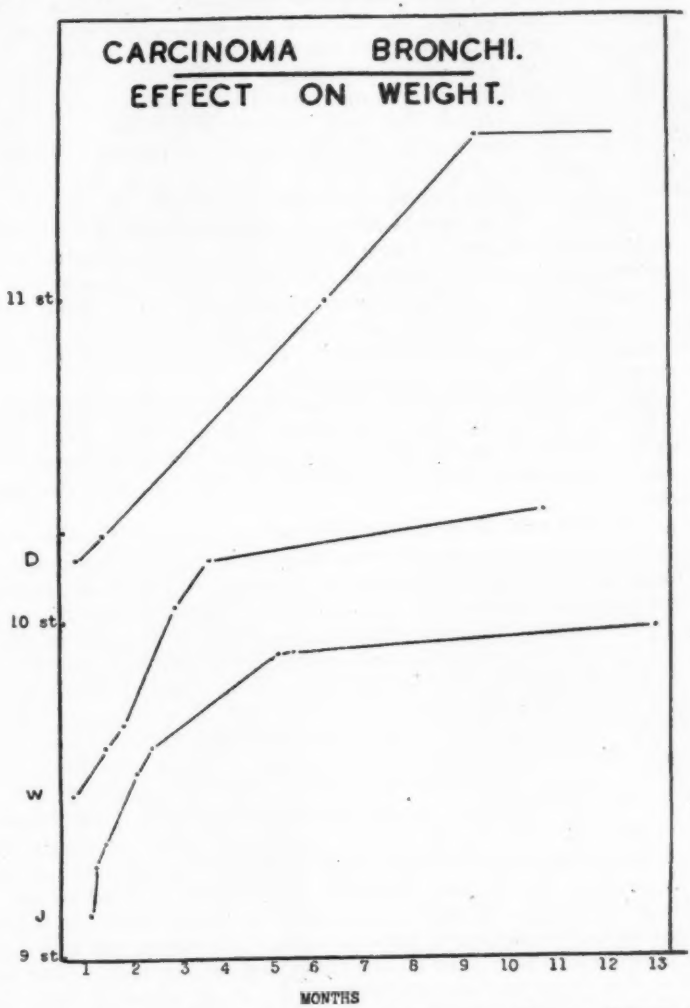

CHART 1.—WEIGHT CHARTS OF THREE PATIENTS UNDERGOING A RADICAL COURSE OF X-RAY TREATMENT DURING THE FIRST YEAR AFTER IRRADIATION.

several months. Pain prevented sleep. The patient looked ill and spoke with a hoarse voice. A radiogram of the chest (Fig. 5) showed a mass in the left hilar region, and a raised left dome of the diaphragm, which on screening showed paradoxical movement. An oblique view showed that the opacity extended into the posterior mediastinum. Bronchoscopy was done on 15.6.40.

Paralysis of the left recurrent laryngeal nerve was noted, and a tumour was found partially obstructing the left main bronchus. The histological report was "oat-cell" carcinoma. A radical course of X-ray treatment was begun on 19.6.40. One month after the end of the course the patient had put on weight, was free from pain and cough, and was talking normally. Laryngoscopic examination showed that the left cord was moving well. A radiogram of the chest (Fig. 6) showed that there was reduction in the size of the opacity in the left hilar region, and that the posterior mediastinum was clear. The left dome of the diaphragm was no longer raised and it moved normally. The patient kept well and symptom-free until the end of the first year. Then he began to complain of some cough and difficulty in swallowing. A radiogram of the chest revealed no abnormal shadows. Bronchoscopy showed that the left main bronchus was clear, but there was narrowing of the left upper bronchus by external pressure. A barium swallow showed narrowing of the œsophagus in the superior mediastinum. These findings suggested a recurrence in the superior mediastinal glands. A second course of X-ray treatment was given. Symptoms disappeared and the patient returned to work. Fifteen months after his first examination he had to give up work because of return of symptoms and deterioration in his general condition. He was admitted to hospital and died ten days later from broncho-pneumonia.

The patient had been able to do full-time work apart from the time taken in having the treatment, and ten days' illness before death. The initial improvement, the period of good health, and then the short final illness is typical of the course of a case of oat-cell or undifferentiated cancer of the bronchus after irradiation.

Case 4.—A man aged 60 was first examined on 6.1.43. He had a history of shortness of breath and a dry cough noticed nine months previously, which had gradually become worse. He gave a history of an attack of pleurisy and several hæmoptyses in November, 1942. He had lost weight during the whole past year. The patient was very thin and pale. A radiogram of the chest (Fig. 7) showed the typical picture of collapse of the right upper lobe, and enlargement of the right broncho-pulmonary glands. Bronchoscopy was done on 12.1.43 by Mr. Price-Thomas, and a large tumour was found obstructing the right upper lobe bronchus. The histological report was squamous cell carcinoma of the non-keratinising type. A radical course of X-ray treatment was begun on 19.1.43. His general condition steadily improved, his cough disappeared, and the dyspnœa became practically negligible. He returned to work four weeks after the end of treatment. A radiogram on 4.3.43 (Fig. 8) shows reaeration of most of the right upper lobe. By 22.7.43 he had put on ¾ stone in weight. On 8.11.43 enlarged glands were noticed in the right supraclavicular triangle, and there was some return of the opacity in the region of the right broncho-pulmonary glands. X-ray treatment was given to the glands in both these areas. The glands responded satisfactorily. The patient remained in fair condition and at work until 5.10.44 when he had another attack of pleurisy. The initial symptoms of cough, dyspnœa, and hæmoptysis returned, and his general condition began to deteriorate. In the middle of December, 1944, he was steadily becoming weaker.

Case 5.—A woman age 53 was first examined on 10.6.40. She had an eight months' history of pain and stiffness in the left shoulder, elbow, and wrist with swelling of the left hand, and had received treatment for arthritis of these joints. In June, 1940, she had complained of pain in the left side of the chest, and a radiogram on 18.6.40 showed an opacity in the left hilar region and a

PLATE VI.

FIG. 1.—CASE 1: RADIOGRAM OF CHEST, SHOWING RIGHT LUNG AFTER PNEUMONECTOMY AND SINGLE ROUNDED OPACITY IN LEFT LOWER ZONE.

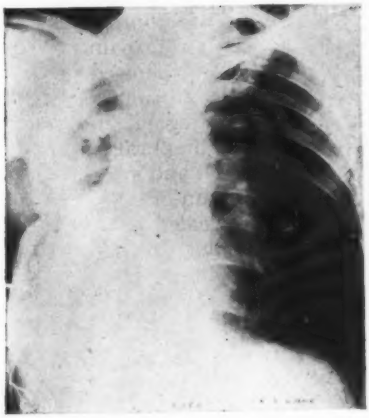

FIG. 2.—CASE 1: RADIOGRAM OF CHEST OF SAME PATIENT, SHOWING REDUCTION IN SIZE OF METASTASIS AFTER IRRADIATION.

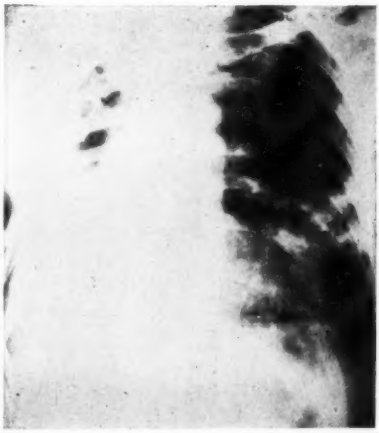

FIG. 3.—CASE 1: RADIOGRAM OF CHEST OF SAME PATIENT, SHOWING REACTION AFTER IRRADIATION PASSING FROM SECOND TO THIRD STAGE.

FIG. 4.—CASE 2: RADIOGRAM OF CHEST OF PATIENT WHO HAD RECEIVED X-RAY TREATMENT TO LOWER ZONES OF BOTH LUNG FIELDS. FOUR YEARS AFTER IRRADIATION.

Fibrotic strands are well marked in left lower zone.

[*To face page* 56

PLATE VII.

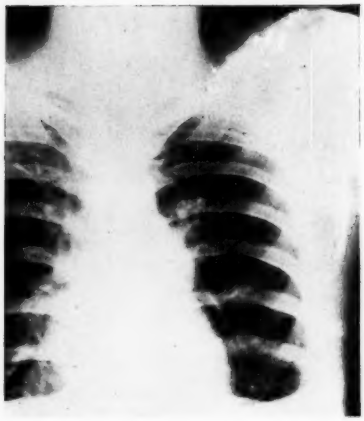

FIG. 5.—CASE 3: RADIOGRAM OF CHEST, 12.6.40, SHOWING OPACITY AT LEFT HILUM.

Biopsy showed oat-cell carcinoma.

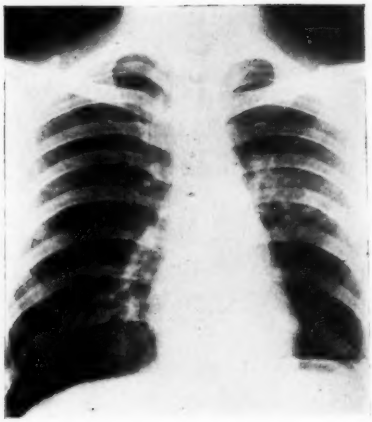

FIG. 6.—CASE 3: RADIOGRAM OF CHEST, 1.8.40, SHOWING REDUCTION IN SIZE OF OPACITY AT LEFT HILUM AFTER COURSE OF X-RAY TREATMENT.

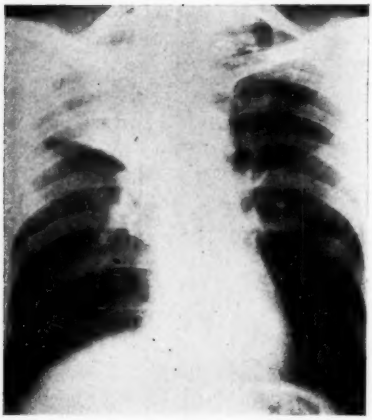

FIG. 7.—CASE 4: RADIOGRAM OF CHEST, 6.1.43, SHOWING COLLAPSE OF RIGHT UPPER LOBE AND ENLARGEMENT OF RIGHT BRONCHO-PULMONARY GLANDS.

Biopsy showed squamous cell carcinoma.

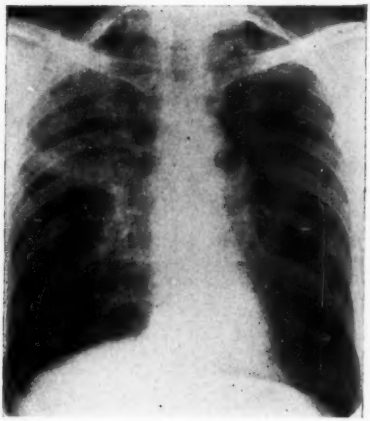

FIG. 8.—CASE 4: RADIOGRAM OF CHEST, 4.3.43, SHOWING RE-AERATION OF RIGHT UPPER LOBE AT END OF COURSE OF X-RAY TREATMENT.

[*To face Plate VIII.*

PLATE VIII.

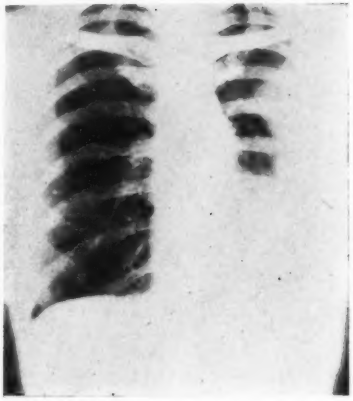

FIG. 9.—CASE 5: RADIOGRAM OF CHEST, 31.7.40, SHOWING OPACITY AT LEFT HILUM AND IN PERIPHERY OF LEFT MID-ZONE AND AN EFFUSION IN LEFT LOWER ZONE.

Biopsy showed adenocarcinoma.

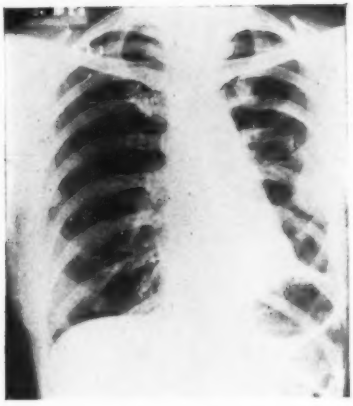

FIG. 10.—CASE 5: RADIOGRAM OF CHEST, 5.10.44, SHOWING CONDITION OF CHEST FOUR YEARS LATER.

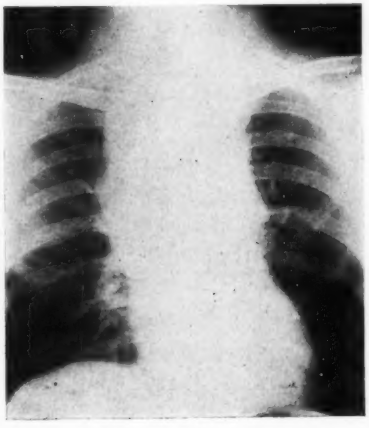

FIG. 11.—CASE 6: RADIOGRAM OF CHEST, SHOWING MEDIASTINAL TUMOUR CAUSED BY GROSS INVOLVEMENT OF MEDIASTINAL GLANDS FROM AN OAT-CELL CARCINOMA OF LEFT MAIN BRONCHUS.

FIG. 12.—CASE 6: RADIOGRAM OF CHEST, SHOWING REDUCTION IN SIZE OF MEDIASTINAL TUMOUR AFTER PALLIATIVE X-RAY TREATMENT.

[*To face Plate VII*

second rounded opacity in the periphery of the left mid-zone. A thoracotomy was done on 4.7.40. A tumour was seen in the left hilar region extending into the posterior mediastinum. Owing to its size and extent, it was considered inoperable. The peripheral tumour was removed and on section showed an adenocarcinoma. Mr. Tudor Edwards kindly referred the case to me. The radiogram taken at the beginning of X-ray treatment showed an effusion obscuring the left lower zone, an opacity at the left hilum, and a rounded opacity in the periphery of the left mid-zone (Fig. 9). A radical course of X-ray treatment was begun on 31.7.40. At the beginning of the course the patient was extremely weak and had a considerable amount of pain in the left side of the chest. Her general condition slowly improved, and she gradually returned to the normal routine of her life. A radiogram taken on 10.4.41 showed that the effusion had disappeared; the mass at the left hilum was smaller, but there was an opacity at the periphery of the left mid-zone as originally observed. This patient did not attend again until 9.11.43 on account of the bombing, but regular reports of her good clinical progress had been received over the three years. When the patient was examined on 9.11.43, she looked well, had a good colour, and had no symptoms referable to the chest, but was complaining of a weak voice. A mass of glands were palpable in the left supraclavicular fossa and there was paralysis of the left recurrent laryngeal nerve. A radiogram of the chest showed no change from the one taken in April, 1941 (Fig. 10). X-ray treatment was given to the enlarged glands. They showed a satisfactory response. During 1944 the general condition of the patient steadily improved, and she put on 1 stone in weight. A radiogram taken at the end of 1944 showed no change since April, 1941, apart from slight shrinking in of the thoracic wall at the site of the thoracotomy incision.

In judging the success of the X-ray treatment, the length of life after treatment can be ascertained and an attempt can be made to assess the health of the patient during this time. A treatment which does not enable the patient to become a useful citizen cannot be considered satisfactory. In no case was it thought worth while submitting a patient to a lengthy course of treatment if the only result was likely to be the prolongation of a miserable existence, or even a curtailment of the life he might expect, especially as it is well known that occasionally some cases of carcinoma of the bronchus—*e.g.*, the squamous type, may live several years without any treatment. All the patients in this series were ill and unfit for work when first examined. The treatment has not been considered successful unless the patient was able to return to a full day's work or to the normal routine of life, whatever it might be.

As has been stated earlier in the paper, all the treated cases in the following tables were fully investigated by the usual methods of X-rays, tomograms, bronchograms, bronchoscopy, and in some cases thoracotomy, and were diagnosed as carcinoma of the bronchus by a thoracic surgeon, a chest physician, and a radiologist. Unfortunately, the histology is not known in all the cases, as it was not always possible to take an adequate piece of the growth at bronchoscopy, nor was it always deemed safe by the surgeon to cut into a vascular growth at thoracotomy.

During the four years 1940 to 1943 inclusive, 179 inoperable cases of cancer of the lung were seen in the department. Table 1 shows the sex and age distribution.

TABLE 1.—AGE AND SEX INCIDENCE

Ages.	*Number.*	*Male.*	*Female.*
20-29	2	1	1
30-39	16	16	0
40-49	33	30	3
50-59	61	57	4
60-69	53	35	18
70-80	14	12	2
Total	179	151	28

It will be seen that the highest incidence in the males is in the sixth decade, but it is interesting to note that the highest incidence is in the seventh decade in females.

In 92 cases the diagnosis was verified by biopsy.

The histology is shown in Table 2.

TABLE 2.—HISTOLOGY

Squamous cell carcinoma	34
Oat-cell or undifferentiated	41
Adenocarcinoma	14
Pleomorphic	3

Comparing these figures with most of those published from other clinics, the proportion of oat-cell or undifferentiated carcinoma is unusually high. In 7 further cases, no biopsy was taken at thoracotomy, because the surgeon did not consider it safe to cut into the tumour. In 31 further cases, the diagnosis was made at bronchoscopy, but the biopsy was not successful. In the remaining 50 cases the diagnosis was based on clinical and radiological findings.

Out of the whole 179 cases, 84 were too ill and the disease too advanced to receive irradiation treatment. Only 47 cases were considered suitable for a radical course of X-ray treatment, the remaining 46 cases receiving only palliative X-ray treatment. Two cases received post-operative X-ray treatment after a pneumonectomy. The following table shows the distribution of the cases during the four years.

TABLE 3

	Total.	*Radical X-Ray Treatment.*	*Palliative X-Ray Treatment.*	*Not Irradiated.*	*Post-operative X-Ray Treatment.*
1940	32	5	10	17	—
1941	46	13	11	22	—
1942	36	8	10	18	—
1943	65	21	15	27	2
Total	179	47	46	84	2

Duration of Life

1. *Patients not Receiving Irradiation*

In 51 out of the 84 non-irradiated patients, the average duration of life was ten weeks. Owing to the evacuation of London, it has not been possible to follow-up all the 84 cases.

2. *Patients Receiving Palliative X-ray Treatment*

The average duration of life of the 46 patients who had received palliative X-ray treatment was five months. The sort of benefit which may follow palliative treatment is seen in Figs. 11 and 12. Radiograms showing reduction in size of a mediastinal mass, caused by gross involvement of the mediastinal

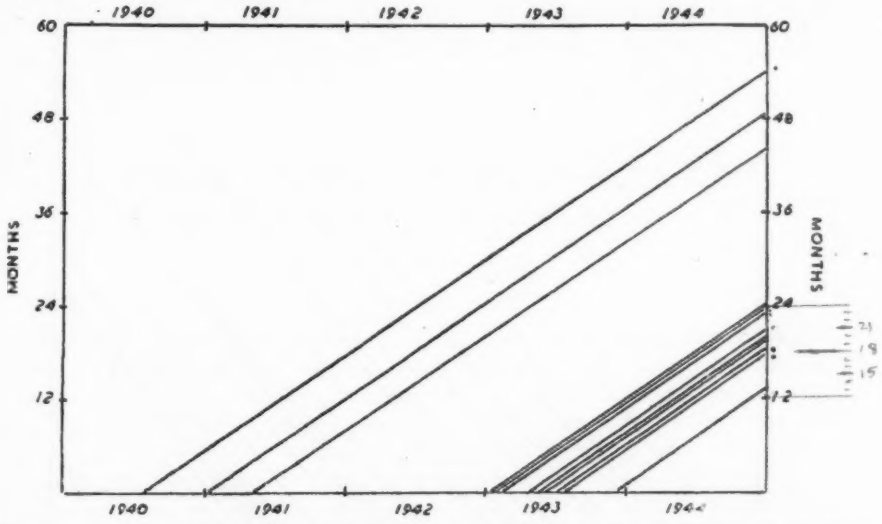

Chart 2.—Chart showing Duration of Life of the Twelve Patients who received Radical X-Ray Treatment during 1940-43, and who are still alive in the Middle of December, 1944.

glands from a small oat-cell carcinoma of the left main bronchus, by X-ray treatment, are shown in Case 6 (Fig. 11) and (Fig. 12). When this patient was first examined, he showed all the signs of superior vena caval block. These signs completely disappeared after irradiation.

3. *Patients Receiving Post-Operative X-ray Treatment after Pneumonectomy*

Of the two patients who received post-operative X-ray treatment, one did not complete his course of irradiation because of the appearance of widespread abdominal metastases, and the second lived in good health for eleven months and then died suddenly; as she had left London owing to enemy action, a post-mortem was not obtained. Both these patients had been referred for X-ray treatment as it was thought that the removal of the growth had been incomplete.

4. *Patients Receiving Radical X-ray Treatment*

The two charts (Charts 2 and 3) show the duration of life of the 47 patients who received a radical course of X-ray treatment. Twelve of these cases were living when these charts were drawn up in the middle of December, 1944. Of these 12, 4 were squamous carcinomas, 1 adenocarcinoma, 1 undifferentiated carcinoma, and 6 of unknown histology. The patient with the adenocarcinoma has lived fifty-two months. Two of the patients with the squamous cell carcinoma have lived twenty-three months, the other 2 eighteen months. The patient with the undifferentiated carcinoma has lived twenty-two months.

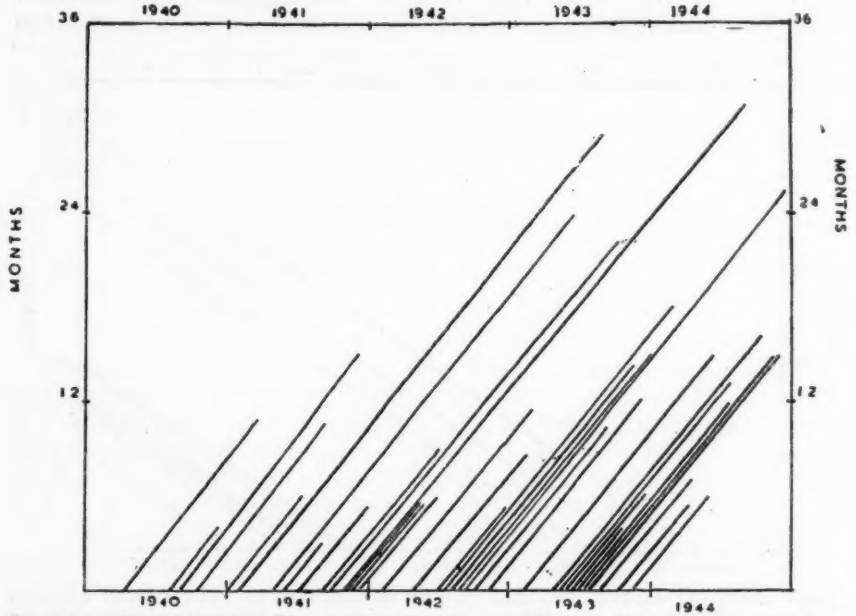

CHART 3.—CHART SHOWING DURATION OF LIFE OF THE THIRTY-FIVE PATIENTS WHO HAD RECEIVED RADICAL X-RAY TREATMENT DURING 1940-43 AND WHO HAD DIED BEFORE THE MIDDLE OF DECEMBER, 1944.

The average duration of life of these 12 living cases so far is 26·5 months. Eight of these are living a normal life.

The duration of life of the 35 patients who died before December, 1944, is shown in Chart 3. Two of these patients had an adenocarcinoma, 10 a squamous cell carcinoma, 7 an oat-cell or undifferentiated carcinoma, and 16 were of unknown histology. The average duration of life was 11·4 months. All except 5 were able to return to work after the end of their treatment.

Summary

(1) An analysis is given of 179 cases of inoperable carcinoma bronchi, during the years 1940-43 inclusive.

(2) The selection of cases suitable for radiotherapy is discussed.

(3) Forty-six patients received palliative treatment. Forty-seven patients received radical treatment.

(4) The average duration of life in the cases not receiving irradiation was ten weeks; in the cases receiving palliative treatment, five months; in those receiving radical treatment who have died before the end of 1944, the average duration of life was 11·4 months.

Twelve out of the 47 who received radical treatment were alive at the end of this survey, and had already shown an average duration of life of 26·5 months.

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A COMPARISON OF TWO TYPES OF TUBERCULIN PATCH TEST

BY HUGH CLIMIE

From the Victoria Hospital, Kirkcaldy

SINCE the introduction of the Vollmer Patch Test, attempts have been made to produce cheaper and more reliable tests for ascertaining cutaneous sensitivity to tuberculin. Two of the most recent have been described by Grozin (1943) who used liquid tuberculin, and Paterson (1944) who used a jelly containing 95 per cent. tuberculin. As both these methods appear to have advantages, it was decided to see how the sensitivity of one compared with the other.

For this purpose a series of 100 persons was selected so that a high proportion of positive reactions would be likely to occur, and these consisted mainly of older child-contacts of tuberculous cases, and young adults, the latter being members of a hospital staff.

Method

The skin of the upper part of each subject's chest was cleaned with acetone and allowed to dry. On the right side a " V " of tuberculin jelly (Allen and Hanbury, Ltd.) with each limb ½ to ¾ inch long, was pressed on to the skin, a dot of control jelly placed above it, and the whole covered with a strip of zinc oxide adhesive plaster. On the left side a drop of old tuberculin (T) was placed on the skin with a glass rod, shaped into an inverted " V " of the same size as that of the jelly, and covered with adhesive plaster without waiting for the liquid to dry. Between the two tests a small piece of plaster was placed as a control.

The strips of plaster were not allowed to get wet, and were removed by the subjects after forty-eight hours, the results being read at seventy-two hours and again later if any reaction was reported within the next few days.

As a check on these tests a Mantoux test was done at the same time, using the same batch of first test strength tuberculin P.P.D. throughout. Those negative to this at seventy-two hours were retested on the other forearm with second test strength tuberculin P.P.D., and the result read seventy-two hours later. A positive result was only recorded if the area of redness *and* swelling measured at least 5 millimetres.

Results

The results of the investigation are tabulated below:

Result.	*Tuberculin Jelly.*	*Tuberculin Liquid.*	*Tuberculin P.P.D. First Test Strength.*	*Tuberculin P.P.D. First and Second Test Strengths.*
Positive	41	42	54	70
Negative ..	59	58	46	30
	100	100	100	100

Readings were clear-cut in most instances, generally showing a papular or vesicular erythema. Sometimes the appearance of only one or two papules raised doubts. It was then found useful to study the reaction daily for a few days. As no response was seen to the control jelly the question arises as to whether it is really necessary.

Plaster irritation was not troublesome and occurred in less than 10 per cent. of cases, but the control patch proved its value in these.

Discussion

Theoretical considerations would perhaps suggest that tuberculin jelly should give more clear-cut results than liquid tuberculin as the latter tends to run. That is so, but the extent of its spread is limited by the plaster, and the latter when pressed on the skin also causes the jelly to spread so that there is not really so much difference between the two readings.

From the results shown it appears that there is nothing to choose between the two methods. The use of liquid tuberculin has the advantage of lower cost, and perhaps of absolute simplicity, as no control is required. An occasional disadvantage, compared with the jelly, is that the liquid sometimes seeps through the adhesive plaster. It is proposed in future to use waterproof adhesive plaster to try to overcome this.

Paterson (1944) says that, in his experience, the jelly patch test, using a "V" with limbs $\frac{1}{2}$-inch long, is comparable in its sensitivity to 0·1 c.cm. of 1/100 old tuberculin given intracutaneously, but Grozin (1943) finds the liquid patch test to compare favourably "with the Pirquet and Mantoux (about 1 : 1,000)." The makers of tuberculin P.P.D. (Messrs. Parke, Davis and Co.), on the other hand, state that, as used, first test strength corresponds to 0·1 c.cm. of standard "O.T." in a dilution of 1/25,000 to 1/50,000, the second test strength being 250 times as strong. In this small series the figures shown above suggest that both patch tests are not so sensitive as first strength tuberculin P.P.D., accepting 5 m.m. of redness *and* swelling at seventy-two

hours as a positive reading. Were this standard raised to 7 mm. it is interesting to note that the percentage of positives to first test strength tuberculin P.P.D. would be 42—practically the same as the figures for the patch tests. It may be remarked, however, that all subjects reacting to first test strength P.P.D. with 3 to 4 mm. of redness *and* swelling, produced very brisk reactions to second test strength, some half-dozen having marked local swelling and tenderness, and even mild constitutional symptoms.

Of those reacting positively to first and second test strength tuberculin P.P.D. the patch tests picked out rather more than half, but this would need to be confirmed on a large series of cases so that the sphere of usefulness of these tests might be more exactly defined.

Conclusion

There seems to be little difference between percutaneous patch tests, using either liquid tuberculin or 95 per cent. tuberculin jelly, but both appear to be slightly inferior in sensitivity to the intracutaneous test, using first test strength tuberculin P.P.D.

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DUST DISEASES AND COMPENSATION
SOME PERSONAL EXPERIENCES*

BY A. MEIKLEJOHN
A Member of the Medical Board for Silicosis

THE present system of Workmen's Compensation was established in 1897. The Act imposed a liability on the employer to pay compensation to a workman injured by accident arising out of and in the course of his employment, or to his dependants if the accident resulted in death. It was not until the Act of 1906 that the same provisions generally were to be extended in certain hazardous industries to cover certain industrial diseases, which in legal nomenclature are deemed " notional accidents."

Compensation is not recoverable for the injury as such or for the resultant disability, but only in respect of loss of earning capacity.

The Departmental Committee for Industrial Diseases appointed in 1906, in seeking to determine which diseases should be included in the schedule, defined three tests:

1. Is it outside the category of accidents and diseases already covered by the Act?
2. Does it incapacitate for more than one week?
3. Is it *so specific to the employment* that causation by the employment *can be established in individual cases?*

* An address to the Yorkshire Tuberculosis Society at Leeds on March 9, 1945.

This Committee agreed that fibroid phthisis occurring in certain industries and processes and then variously known as grinder's rot, potter's rot, mason's phthisis, or miner's lung, fulfilled these requirements. Owing to peculiar difficulties of administration, chiefly medical certification, they recommended that it should be dealt with by trade schemes rather than by placing the liability on the individual employer.

In 1919 the first trade scheme to provide compensation for silicosis in Great Britain was made. This was the Refractories Industries (Silicosis) Scheme, 1919, which applied to workmen engaged in certain processes in connection with the getting or manipulation of refractory material containing not less than 80 per cent. total silica (SiO_2) with a view to manufacture or sale. It provided for certification by appointed medical officers (who actually were tuberculosis officers) subject to appeal to a Medical Appeal Tribunal of three.

It is of particular interest that under this scheme no compensation was payable in respect of silicosis accompanied by tuberculosis, unless the silicosis was so far advanced as to make the workman specially liable to tuberculosis or, although not so far advanced, was likely to accelerate materially the progress of the disease. A Departmental Committee which inquired into the working of the scheme in 1924 suggested certain amendments, one being that when silicosis with tuberculosis was found it should, for purposes of a claim to compensation, be deemed in the same way as silicosis *un*accompanied by tuberculosis. They also recommended the setting up of a whole-time Medical Board in place of the previous medical machinery. Legislation was secured to enable these amendments to be made, and they now apply in all existing schemes of compensation for industrial pulmonary fibrosis due to dust. Furthermore, there is no quantum of silicosis specified and it is not necessary to establish that the tuberculosis (which means tuberculosis of the lungs) supervened on the silicosis. All that is necessary is that the two lesions should exist simultaneously (*i.e.*) silicosis accompanied by tuberculosis.

Similar schemes for other industries followed, but we need not pursue these historical developments.

You may legitimately ask, "Why not simply apply the schemes to all workmen certified to be suffering from the disease?" The chief reason is that the liability to pay compensation is placed on the individual employer, and it is only natural justice that the employer should be aware of his liability and so able to insure the risk. Moreover, this insurance is a safeguard for the workman and his dependants, as it provides reasonable security that the claim can be met when it arises.

In 1930 the Government considered that experience of the operation of the schemes and medical arrangements was sufficient to justify the consolidation of existing legislation, and to empower the Home Secretary to make any additional schemes for silicosis or asbestosis, or either of these diseases accompanied by tuberculosis.

June 1, 1931, marks the commencement of the present development. Schemes in respect of silicosis or silicosis accompanied by tuberculosis were made or re-enacted for the Refractories Industries, the Sandstone (quarrying) Industry, and the Metal Grinding Industries. An omnibus scheme, the Various Industries (Silicosis) Scheme, 1931 (originally made in 1928), provided for

workmen in specified occupations and processes; among them the mining and quarrying of silica rock, coal mining, mason's work on sandstone and granite, the crushing or grinding of silica rock, steel foundries (fettling and sand-blasting), potteries and tin mines. Subsequent amendments have added hæmatite miners and workers in slate mines. A special scheme in respect of asbestosis or asbestosis accompanied by tuberculosis was made for the Asbestos Manufacturing Industry. Experience of claims for compensation by coal-miners, especially in the South Wales area, subsequently revealed that these workmen suffered from a specific fibrosis of the lungs, which caused disablement and death but which did not conform to the internationally accepted standard for the diagnosis of silicosis. An inquiry was instituted, and following consideration of the Report[1] further amending legislation was obtained enabling schemes to be made for pneumoconiosis—*i.e.*, fibrosis of the lungs due to any dust. A Pneumoconiosis Scheme for the Coal Mining Industry was forthwith made under these powers—viz., The Coal Mining Industry (Pneumoconiosis) Compensation Scheme, 1943. This scheme applies to all underground workmen and certain specified surface workers, who suffer from pneumoconiosis, including the condition of the lungs known as dust reticulation.

Let me emphasise that compensation for dust reticulation or that disease accompanied by tuberculosis is as yet restricted to specified workmen employed in or about a coal mine.

Byssinosis is an asthmatic condition long recorded and observed in workmen who have spent many years in cotton card rooms. Compensation for this disease has been provided for by a Special Act and Scheme in which the responsibility of certification has been placed on a separate Medical Board specially constituted for the purpose.

Before passing I wish to make this very clear. The schemes apply to workmen, and those workmen only, employed in the prescribed occupations or processes on or after a defined date and within prescribed limits generally from the date of the injury as certified by the Medical Board. Might I suggest that each of you should keep on your files copies of these schemes for reference, or alternatively the latest edition of " Willis's Workmen's Compensation." Only by regular reference to these can you inform yourself of the intricacies of the schemes and so be able to give your patients reliable guidance in these matters. It is not a question of what you think ought to be but entirely of what the existing law on the subject is.

The Home Secretary by virtue of the powers conferred on him by the empowering Act of 1930 made The Silicosis and Asbestosis (Medical Arrangements) Scheme, 1931, to unify and co-ordinate the medical arrangements for carrying out the medical requirements, and giving the medical certificates under all the silicosis and asbestosis schemes. These arrangements were extended in 1943 to cover the Pneumoconiosis Scheme. Under the scheme a Medical Board consisting of specially qualified full-time medical officers was established. The Board acts by panels, each of two members, under the supervision of a Chief Medical Officer. The panels are located at centres at which there exists a concentration of the industries in which the scheduled diseases occur. To each panel is assigned an area so that the whole of Great Britain is provided for. At present the Board consists of the Chief Medical Officer and seven

panels. The Chief Medical Officer has his headquarters at Sheffield. It is his duty to supervise the working of the medical arrangements with a view to securing a uniform standard of efficiency and generally to co-ordinate the work of the panels.

The panels are located as follows: one each at Sheffield, Manchester and Stoke-on-Trent, and two each at Cardiff and Swansea.

The principal duties assigned to the Medical Board are:

1. To deal with applications for certificates of suspension or disablement.
2. To deal with all applications for certificates of death.
3. To make the initial examination of workmen engaged for work in certain scheduled processes in which such examinations are prescribed.
4. To make the periodical medical examination of these workmen at the prescribed intervals.

A certificate under the scheme can only be given on the authority of not less than two members of the Medical Board. This is the reason for panels of two. It is a safeguard for the worker and the employer. Every applicant for a certificate of suspension or disablement, except in serious emergency, must be examined by two members, who if in agreement complete the certificate. Where the panel are not agreed and in cases of special difficulty the case is submitted to the Chief Medical Officer, whose decision must be followed.

No application may be determined without a complete clinical and radiographic examination. The radiographic examinations are usually made by reference to a local consultant radiologist, consultant tuberculosis officer or local hospital.

The certificate of the Medical Board when issued is final and conclusive as to the matters therein certified and is legally binding; it cannot be disputed in any court of law or by reference to other medical authority. In short there is no appeal against the Board's decision. Moreover, once they have given their certificate the Medical Board are *functus officio—i.e.*, they have discharged themselves of their full duties. They may not reconsider their decision or amend their certificate in any way. The workman, of course, is entitled to make a fresh application so long as he conforms to the prescribed time limits.

In death cases a certificate may only be given, save in very exceptional circumstances, after a post-mortem examination performed by or in the presence of at least one member of the Medical Board. A post-mortem affords conclusive evidence in the diagnosis of the disease. But for the purposes of the scheme it is necessary not only to determine if the disease is present, but also whether the disease has actually caused or materially accelerated death. The fact that a workman had been certified to be suffering from the disease in life and obtained the award of compensation has no bearing. Death constitutes a new event, and the cause of death must be determined solely on the facts as revealed at the post-mortem examination.

Dr. S. Roodhouse Gloyne, Consulting Pathologist of the London Chest Hospital, has been officially appointed to make any histological examination required. The panel, however, while carefully considering his report must personally examine the sections to arrive at their decision.

In certain industries—refractories, sandstone, pottery, and asbestos—

where the incidence of the disease (silicosis or asbestosis respectively) is serious, initial or entrance examination followed by periodical medical examination at prescribed intervals is required by statute. The examinations are carried out by the Medical Board who attend by appointment at the actual place of work. Arrangements have been made in certain areas for the tuberculosis officers to carry out initial examinations, the reports of such examinations being sent to the Medical Board so that any certificate of suspension may be issued by them. The prescribed standards of fitness which initial examinees must satisfy are as follows:

1. The chest must be at least of average development, and the respiratory passages must be free from obstruction.
2. There must be no signs of disease of the lungs or heart; and
3. There must be no tuberculosis of any region.[2]

Why not apply these examinations to all workmen in all the industries covered by the compensation schemes? Such would be ideal but administratively it is not practicable. Moreover, they are only of real value where there is a reasonably stable fixed population at risk and reasonably concentrated geographically.

As I hope to show later, what really is needed is a new intimate knowledge of these industrial risks by the whole of our profession, in order to give sound guidance to patients in the choice of occupation or when to advise alternative employment.

In the case of a workman who makes application to the Medical Board for a certificate to enable him to claim compensation from his employer the Medical Board have to determine:

1. Is the workman suffering from the disease?—*i.e.*, the diagnosis. This involves:
   (*a*) the disease and its complications; and
   (*b*) other diseases and conditions not related to the disease, or what Lord Romer has designated, " extraneous " diseases.
2. To what extent, if suffering from the disease, is the workman's general physical capacity for work impaired by *reason of the disease.*
3. On what date did such disablement commence?

The Diagnosis

Time does not permit me to discuss the details of diagnosis and differential diagnosis of the various dust diseases and their complications. In fact they are not to be learned from lectures and textbooks, which usually only deal with the illustrative composite case so seldom seen in practice. The knowledge is only to be acquired by personal observation and investigation. I want, however, to indicate some points of approach, which in my experience are not generally appreciated yet are of supreme importance.

It is generally accepted that the diagnosis depends on the triad:

1. Clinical history and clinical examination.
2. The history of the occupational risk.
3. Radiographic examination.

To these I would add separately:

4. Symptomatology.

The workman should be investigated as a patient, a human being; not as a case, a plaintiff for compensation. Long experience has convinced me that, with rare exceptions, the workman is honest and straightforward, and all he seeks is full impartial investigation of his condition.

The Symptomatology

You are all familiar with the early symptoms, the dry unproductive morning cough, even to the point of vomiting; the dyspnœa on exertion; the sense of exhaustion before the end of the day's work. These have to be accepted as true statements, but the doctor by his experience must learn how to confirm their reality and assess their degree. It is very remarkable how diffident the average workman is to admit the spitting of blood.

The Occupational History

A critical and accurate estimate of the dust risk to which the workman has been exposed is fundamental. Simply to ask a man what his occupation is and to record this without further investigation is futile. Besides, do not forget that a married woman, now wholly engaged in her domestic duties, may have spent a considerable number of years in a dangerous dust process, such as the packing of abrasive soap powder or the weaving of asbestos textiles. There is but one sure way and it should be applied to every patient. All too often the occupational details are only investigated when the X-ray film suggests an occupational fibrosis. Start at the age of leaving school, and itemise chronologically by years the periods and nature of employment to date. Leading questions must be put to establish the nature of the processes, the tools and materials used, other processes in the same workroom, any protective mechanism or equipment in use during work, and the general factory conditions at different seasons. But ability to elicit and evaluate this information can only come from intimate knowledge acquired by regular visits to factories and other workplaces during working hours.

In tuberculosis the importance of environment is constantly emphasised. By this housing and home conditions are usually indicated. Factories and working conditions are equally important. It is your duty in your own area to study them by personal visits. The fetish that you can do it at secondhand through a sanitary inspector or health visitor must be abolished. The average employer will welcome your interest and afford the facilities. You will be thrilled by the romance of industry; often you will be appalled by what men and women have to do and suffer to earn their daily bread.

The Clinical Examination

With the advance of chest radiography there has been a definite tendency to depreciate the value of clinical methods. That radiology has greatly assisted the chest physician is indisputable. In fact no chest examination can be con-

sidered complete without it. But the X-ray film must be the servant and not the master, and it is but a single unit in building the diagnosis. If any of you are inclined to doubt the value of clinical methods, turn to the pages of some old clinical manual such as Finlayson, or read the original description of diseases such as Bright on kidney disease. Realise what they achieved by their five senses.

Again, in recent years there has been discussion of the relative value of percussion and auscultation. Isn't the truth here that some by aptitude are more expert in the one than in the other? Those who are master of both are truly blessed.

But I want to plead for what McDougall[3] has called " the simple but vital technique of inspection "; yes, a technique; not simply a few hasty haphazard glances. The facies of disease is no myth as every true clinician well knows. And what you see must be recorded because much of the data is of value in the interpretation of the radiograph. Important points are the chest formation, the development and coverings of the chest wall, and in women particular reference to the development of the breasts. The structures of the neck amply repay careful inspection.

Then there is the question of clubbing of the fingers and of the toes in particular cases (see Lovibond[4]). I would also include cyanosis, but apart from gross manifestation I must confess my inability to recognise it with certainty.

And before leaving the clinical investigation I would plead with you, above all, for clinical honesty. If you detect nothing abnormal, say so, no matter what you suspect or what gross disease is ultimately revealed on the X-ray film. On the other hand, where the radiograph appears to show no abnormality don't immediately abandon your clinical findings which suggest pathological changes.

Radiology

This might easily have formed our sole topic tonight. I must repeat that no examination of the chest is complete without X-ray examination. In practice this is usually fulfilled in the ordinary case by screen examination and a postero-anterior film. In particular cases other views may be required and on occasion stereoscopy, tomography, and bronchography are additional helps. But a film is not enough; it must be a film of high technical excellence —*i.e.*, properly exposed and carefully processed. It is remarkable how seldom an average adult chest is properly accommodated on a 15×12 inch film. For this reason I prefer 17×14 inch films.

Having obtained an adequate film the question arises as to who shall read it. Unless the clinician and radiologist sit conjointly then I submit the clinician. If the radiologist wishes to make the reading then he must be prepared personally to supplement his technical operation with full clinical examination. As I have previously indicated, before you commence to read the film you require the clinical record to provide such data as age and sex, chest configuration and development, and mammary development.

The next question is what form the reading should take. On this matter J. V. Sparks[5] has recently written: " The radiologists, always optimistic,

were far too ready to 'diagnose' from the radiographic findings rather than to describe the abnormal shadows seen."

I am definitely for the descriptive and against the interpretative reading. For diagnosis is a conclusion only to be reached after all the available evidence from all methods of observation has been considered and carefully judged. And so the reading should be a catalogue of the abnormal shadows with special reference to their type and distribution. But this demands an intimate knowledge of the limits of normality according to sex and age. These words of the poet are worthy of remembrance: " What the eye half perceives and half creates."

Frequently the question is put to me, " How do you correlate the clinical with the radiographic signs?" That is not the proper correlation, which is between the radiographic appearances and the morbid anatomical changes as observed at the post-mortem examination. Regularly, in considering a case, I ask myself, " What changes would you expect to find if the patient were the subject of a post-mortem examination now?" Of course, I realise that the average area consultant tuberculosis officer seldom sees a post-mortem examination. You ought to be granted the opportunity of regular attendance at these examinations at a local general hospital, and so be enabled to correlate the pathological with the clinical and radiographic findings.

In the early part of my remarks I directed your attention to the criteria defined by the Departmental Committee for Industrial Diseases. I want to recall number three.

Is the disease so specific to the employment that causation by the employment can be established in individual cases?

Having regard to this, certain standards for the diagnosis of silicosis have been defined and have received international recognition. I want you to note particularly the definition of the first stage—*i.e.*, the earliest specific stage at which it is considered that the disease fulfils the criterion quoted.

" The first stage shall be defined as characterised by:

(*a*) The appearance of the earliest detectable physical signs of the disease; with

(*b*) radiographic appearances not less than the presence of nodular shadows together with an increase of the hilum shadows, linear shadows, and pulmonary reticulum; and

(*c*) with or without impairment of capacity for work."[6]

And finally, having assembled our data, symptomatology, occupational history, clinical examination and radiographic appearances, we are in a position for the first time to attempt the diagnosis. But if the course I have outlined is followed carefully and honestly, a very high degree of accuracy can be achieved in the recognition of the dust diseases and their complications.

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REPORTS OF SOCIETIES

JOINT TUBERCULOSIS COUNCIL

THE Joint Tuberculosis Council, at their meeting in London on November 18, discussed several matters of importance to tuberculosis officers and other tuberculosis workers.

Outstanding was the decision to approach the Ministry of Health regarding the proposal of the General Nursing Council to set up a post-registration part of the Nursing Register for tuberculosis nurses. The J.T.C. decided to join with the Tuberculosis Association in a deputation to the Minister, protesting against the G.N.C.'s proposal, and meanwhile authorised the sending of a letter asking the Minister to defer any decision on the subject until the deputation has had an opportunity of presenting its case. The G.N.C. propose to admit to the new part of the Register only nurses who are already registered on the General Part. The J.T.C. took the view that membership of the General Part of the Register is not an indispensable requirement in the nursing of tuberculosis, and said that although previous general experience is obviously desirable and welcome, the lack of it should not debar a girl who is willing to adopt tuberculosis nursing as a career from achieving her wish. Moreover, it is maintained by the J.T.C. that the attractiveness of the new part of the Register will be virtually destroyed if it means (as, in its present form, it does mean) that nurses who have qualified for the General Part after years of training must return to the status of learners in order to obtain the tuberculosis registration.

Another subject discussed at the meeting, of great interest to nurses, was that of the assistant nurse. The Joint Nursing Committee of the J.T.C., the Tuberculosis Association, and the N.A.P.T. submitted a report in which it was pointed out that the views and experience of those directly responsible for tuberculosis nursing were not adequately represented in the membership of the Assistant Nurses Committee, set up under the Nurses Act, 1943. It also observed that it would not be to the advantage of the larger sanatoria to take part in the training of assistant nurses, as suggested by the G.N.C. Sanatoria might, at times, be teaching four different categories of nurses—namely: student nurses under an affiliation scheme; seconded student nurses received for three months' tuberculosis experience; State Registered Nurses receiving post-graduate training in tuberculosis nursing; and trainees for the T.A. Certificate. The provision of separate instruction for assistant nurses sent as pupils for six or twelve months would, in the view of the Joint Committee, be unprofitable. The joint Committee expresses the strong belief that the need for special training for nurses who undertake the care of tuberculous persons is not generally appreciated, because their work is not understood by people who have never themselves had experience of it. The training pro-

posed for assistant nurses is described as stereotyped and likely to produce only " a pale shadow of a general trained nurse."

Post-graduate instruction of medical practitioners in tuberculosis work was also discussed by the J.T.C., on Dr. F. R. G. Heaf's report of recent meetings of the Joint Education Committee. The Committee had agreed that some national organisation which would afford post-graduate instruction was imperative, not merely to meet the needs of home practitioners, but also those of Empire and Colonial students. It was envisaged that a tuberculosis educational institute might be established, and, as a preliminary, the N.A.P.T. had been asked to appoint a clerical assistant to be concerned principally with the work of such an institute. The institute would, it was hoped, act as a national centre for education in tuberculosis and allied subjects for doctors, trained nurses and lay workers. It would arrange both regular and occasional courses of study for the different groups, co-ordinate the teaching, grant scholarships, establish a library, and generally act as a link between existing educational facilities throughout the Empire and those seeking instruction. The J.T.C. asked for further details of the scheme, with a view to its fuller consideration at another meeting.

Other business transacted by the Council included a welcome to Dr. J. S. Westwater as an observer from the Department of Health for Scotland; the appointment of a committee to consider the post-war use of E.M.S. hutments; the announcement that U.N.R.R.A. was sponsoring the publication of a manual dealing with all aspects of the detection of tuberculosis by clinical, radiological, and bacteriological methods (the material for the manual having been contributed by J.T.C. members); and the appointment of members on a joint deputation to the B.M.A. to discuss the need for a national campaign for a safe milk supply.

The present officers were nominated for re-election next year. Dr. James Watt is the Chairman of the J.T.C.; Drs. D. P. Sutherland and N. Tattersall, Vice-Chairmen; Dr. A. P. Ford, Honorary Treasurer; and Dr. N. England, Honorary Secretary.

THE Joint Tuberculosis Council which met in London on February 17, 1945, unanimously re-elected Dr. James Watt as Chairman, Drs. D. P. Sutherland and N. Tattersall as Vice-Chairmen, Dr. A. P. Ford as Honorary Treasurer, and Dr. Norman England as Honorary Secretary.

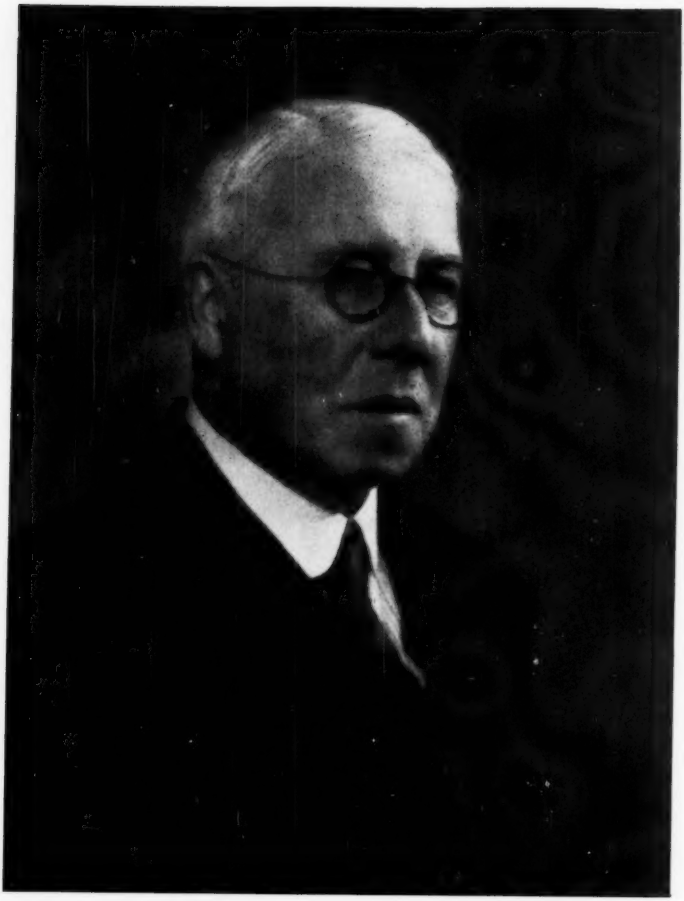
The Council adopted a resolution recording its deep sense of loss at the death of Sir Henry Gauvain (Chairman of the Joint Tuberculosis Council from 1926 to 1929) and conveying sympathy to Lady Gauvain.

Ministry of Health Memorandum 146/T was further discussed, and the Council decided that certain matters in it which had been brought to their notice came within the province of the Society of Medical Officers of Health rather than the Joint Tuberculosis Council. The correspondence (chiefly referring to the rates of payment for the examination of pension applicants by Tuberculosis Officers) was accordingly referred to the Society for consideration.

It was decided to ask the British Medical Association to receive a deputation representative of the Joint Tuberculosis Council and the Tuberculosis Association on the need for a national campaign for a safe milk supply. The National Association for Prevention of Tuberculosis were invited to join in the deputation.

Dr. G. Jessel reported that ten memoranda on tuberculosis subjects had been prepared for publication for U.N.R.R.A. The memoranda would form a manual for distribution to medical practitioners and others dealing with

PLATE IX.



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tuberculosis problems in occupied countries after liberation. 1,000 copies of the manual would be distributed to tuberculosis workers in Britain by the Ministry of Health. The subjects covered by the memoranda included administration, dispensary and sanatorium treatment, rehabilitation, bacteriological diagnosis, differential diagnosis, mass radiography, surgical treatment, non-pulmonary tuberculosis and tuberculosis in childhood. Seven of the authors were members of the J.T.C.

Approval in principle was given to a proposal submitted by the Committee on Education (jointly set up with the N.A.P.T.) for the establishment of a Tuberculosis Educational Institute. Further details of the proposal will be available later.

IN MEMORIAM

THEOPHILUS NICHOLAS KELYNACK

By the death of Dr. T. N. Kelynack, J.P., at Harpenden, the defective, and more particularly the tuberculous, child has lost a warm-hearted friend. Those who knew him, and there were many, have lost a kindly, agreeable and helpful colleague.

Dr. Kelynack was a student of the old Victoria University, studying medicine in Manchester; he graduated in 1889 and was awarded the Gold Medal in Medicine in 1893 at his doctorate. He became a Member of the Royal College of Physicians in 1895. He held a number of house appointments in the Manchester Royal Infirmary, and was for a time lecturer in pathology in Owens College, the forerunner of Manchester University. He then took up consultant work in London.

His appointments at Mount Vernon Hospital and the Harpenden Sanatorium for tuberculous children showed the trend of his interests, further shown also by his numerous publications—*e.g.*, those entitled "Open-Air Schools," "Sanatorium Treatment of Consumption" and "Tuberculosis in Infancy and Childhood" (1908)

These wide interests brought him on to the staff of the Royal Institute of Public Health, where he played a prominent part for many years, particularly in the lectures and the Annual Conferences for which he and Professor E. W. Hope were joint Honorary Secretaries for a prolonged period, a very fruitful partnership. These conferences were a great success and brought together a large number of persons interested in various aspects of preventive medicine.

Like other students of sociology Kelynack noted how often neglect and intemperance of parents were inimical to their children, and he became a champion of temperance, taking great interest in the Society for the Study of Inebriety; he was editor of "The Drink Problem of Today" as well as "Defective Children."

Kelynack edited the BRITISH JOURNAL OF TUBERCULOSIS for more than twenty-five years, until 1934. For the greater part of this time the Journal was the sole publication of its kind in this country serving the needs of its specialised subject. That the journal survived, went through the last war, and retained a consistent place in the reading of many in the tuberculosis service shows that Kelynack did yeoman work; and it shows as well that he held the affection of many colleagues prepared to support his work by papers for the

Journal. Kelynack worked unaided; and only those who have had a similar editorial experience can really gauge the labour that his long control of the Journal must have entailed, and how much the Journal owes to those early fruitful years.

The death of his wife in 1940 was a grievous loss to him. His daughter Agnes entered the medical profession and is Assistant Secretary to the British Medical Association.

C. D. S.

REVIEWS OF BOOKS

Tuberculosis of the Ear, Nose, and Throat. By MERVIN C. MYERSON, M.D. Pp. xii+291. 89 illustrations. Price 30s. London, Baillière, Tindall and Cox.

This new American work is based on the author's experience with over ten thousand cases of tuberculosis. Over half the book is occupied with an account of laryngeal tuberculosis, but there are full descriptions of the disease as it also affects the ear, nose, mouth, pharynx, œsophagus, trachea, and bronchi.

The author analyses the figures of 1,000 cases of laryngeal tuberculosis seen by him, and it is of interest to note that of 116 solitary lesions, 29 (25 per cent.) were of the epiglottis, coming second only to the inter-arytenoid region as the most common site. This is quite different from the experience of StClair Thomson and Ormerod. StClair Thomson found that of 142 cases with solitary lesions, in only 6 (4·2 per cent.) was the epiglottis affected. The more recent (1936) figures of Ormerod show a frequency of one in 65 cases. This wide difference between the American and English figures may partly be explained by the inclusion of more cases under the term lupus of the epiglottis by the English writers, but the description by the author of the lesions of the epiglottis indicates a true geographical difference in incidence.

Incidentally lupus of the upper respiratory tract would appear to be an extremely rare disease in America. StClair Thomson's figures for the sex incidence of laryngeal disease have been misquoted. Reference to the M.R.C. report has confirmed that, though the crude figures (which incidentally are those given by the author) indicated a greater frequency in the male, yet the corrected figures show the incidence to be the same in both sexes.

The pathology of the disease is described very fully, and the clinical aspects are completely dealt with. The diagrams more resemble the rough drawings made in a busy practice than the beautiful paintings in water colour of Henry Smurthwaite. Whilst giving a clear idea to the experienced laryngologist, the tyro would gain a better impression of the appearances from a coloured or more carefully drawn picture. Many of the photomicrographs are reproduced at too low a magnification. There is a complete account of the bronchoscopic appearances of the disease and illustrative case histories.

The treatment of tuberculosis of the upper respiratory tract follows closely on the lines accepted in this country, and is dealt with fully and critically. An exception is lupus of the nose; the author has found no real merit in contact ultra-violet light therapy and prefers coagulation or curettage.

The book is written in a clear, direct style and the idiom does not jar the English reader. The binding and printing are excellent and there is a comprehensive index.

Pulmonary Tuberculosis. A Handbook for Students and Practitioners. By R. Y. KEERS and B. G. RIGDEN. E. and S. Livingstone Ltd., Edinburgh. Pp. 273. Price 17s. 6d.

At the present day when the subject of pulmonary tuberculosis is so much to the fore, both among the medical profession and the laity, a handbook setting down the modern conceptions of the disease is both timely and welcome.

The early chapters are devoted largely to the bacteriology and pathology. The importance of isolating the tubercle bacillus is stressed; several negative sputa are not sufficient, the organisms being sought from the larynx, stomach, and fæces when necessary. The latest methods of demonstrating the bacillus in the laboratory are described.

In the subsequent chapters emphasis is laid on the early radiological diagnosis and the treatment. Only the methods of collapse therapy which have stood the test of time are described, and the importance of calling in the surgeon early for adhesion section in a contra-selective pneumothorax and for thoracoplasty in suitable cases is to be commended. Although mass-radiography is the obvious method of " picking up " the early case, the management of such a case has not received sufficient attention and might well have replaced the detailed physical examination of the chest to be found in any standard textbook. The use of phrenic interruption in early cases where some form of collapse is considered, but in which prolonged treatment with a pneumothorax is not considered justifiable, might have been discussed. The use of gold is advocated in certain cases, but it is doubtful whether it has any use in modern therapy. The long experience which the writers have had in the sanatorium side of the treatment makes the regime outlined particularly valuable.

The inclusion of an account of tracheo-bronchial tuberculosis as a complication is welcome, having received insufficient attention in the past; its clinical features are described as also is the way it interferes with collapse therapy.

The book is profusely illustrated with X-rays. Radiographs of the chest are difficult to reproduce with any degree of detail in textbook form, and on the whole the quality of these pictures is good. The student will find the small diagrams under the films a useful adjuvant.

The authors are to be congratulated on their book, which will help to straighten out many of the baffling problems which the disease presents to the student, and should enable practitioners to select those cases suitable for special forms of treatment, and to undertake supervision of those at home with increased confidence.

Social Aspects of Tuberculosis. By ROODHOUSE GLOYNE, M.D. Faber and Faber, London. Price 8s. 6d.

What is Tuberculosis? By MILOSH SEKULICH, M.D. Heinemann, London. Price 3s. 6d.

Of all diseases, tuberculosis has perhaps most claim to the adjective " social." Factors in social environment determine its incidence in a community, and having once become established it plays its own part in the production of new problems in community life. To such an extent do social factors alter a patient's prognosis that it is true to say that a knowledge of the factors contributing to the prevention and treatment of tuberculosis, and the care of the tuberculous patient, is as important for the social worker and the politician as it is for the doctor.

Dr. Roodhouse Gloyne's book is written primarily for social workers. He gives a full and clear account of the extrinsic and intrinsic factors involved in the production of a clinical case of tuberculosis. Of these factors he particularly emphasises racial immunity, malnutrition and overcrowding. The importance of improved housing conditions is emphasised again and again in connection with preventive work, though the problem is discussed as to whether on a given low income the patient is benefited by spending a high proportion on food and a low proportion on rent, or *vice versa*.

An excellent description is given of the services at present available for the treatment of the tuberculous patient, and the means of aiding him and his family in financial matters until he is again fit to earn his livelihood. His rehabilitation and care after institutional treatment is finished are described fully as parts of active treatment. Finally, a summary of legislation relating to tuberculosis is given.

In all this excellent material the emphasis is placed on the fact that more must yet be done in the improvement of social conditions, as well as the carrying out of purely medical measures, if the morbidity and mortality rates from tuberculosis are to decrease. Especially is this so in the childhood and young adult groups where the most intimate social unit, the family, is so vitally involved. The author says very little directly about the upset of family life caused by the disease, but this major problem is dealt with implicitly in much that he says on other matters. His sympathetic attitude is probably best expressed in the following sentence from the book: " One of the most serious problems of this unique disease is the control of massive infection quietly and unostentatiously, without creating an atmosphere of isolation and segregation which makes a patient feel that he is a leper." The book is one which should be read by all social workers who come into contact with tuberculosis.

Dr. Sekulich apparently sets out with much the same ideas in mind as those which Dr. Roodhouse Gloyne succeeds in expressing. Unfortunately, however, the Yugoslavian author is obviously hampered by the necessity of writing in a foreign language, and the result is lack of clarity of meaning and lack of continuity in the presentation of subject-matter. Largely because of these defects the book fails in its praiseworthy object of presenting the facts about tuberculosis to the lay public and the concern they raise regarding social and medical reconstruction on the continent of Europe, and particularly in Yugoslavia.